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EXAMINER	
TORRES, JUAN A	
ART UNIT	**PAPER NUMBER**
2611	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/676,503	CARBONARI, DAVID	
	Examiner	Art Unit	
	Juan A. Torres	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 September 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-57* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-57* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 September 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

Figures 1 and 2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g) (see "wireless data blaster", Scientific American, 2002 Vol. 286, No. 5 May 2002 pp 64-69).

The drawings are objected to because:

a) In figure 7 block 222 the recitation "Multiply First Output Signal and Incoming Signal" is improper (see figure 4); it is suggested to be changed to "Multiply First Duplicate Output Signal and Incoming Signal".

b) In figure 7 block 226 the recitation "Multiply Delayed Phase Signal and Incoming Signal" is improper (see figure 4); it is suggested to be changed to "Multiply Delayed Phase of Second Duplicate Signal and Incoming Signal".

c) In figure 8 block 230 the recitation "Multiply First Quantized Signal and First Output Signal" is improper (see figure 4); it is suggested to be changed to "Multiply First Quantized Signal and Second Output Signal".

d) In figure 8 block 232 the recitation "Multiply Second Quantized Signal and First Output Signal" is improper (see figure 4); it is suggested to be changed to "Multiply First Quantized Signal and Second Output Signal".

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure

number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The

disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

The abstract of the disclosure is objected to because the use of legal phraseology. It is suggested to delete the last 2 sentences of the abstract. Correction is required. See MPEP § 608.01(b).

The disclosure is objected to because of the following informalities:

a) In page 2, line 7 the recitation "CAT scans" is improper because CAT has not been presented before; it is suggested to be changed to "Computed Axial Tomography (CAT) scans".

b) In page 6, line 12 the recitation "CATV provider" is improper because CATV has not been presented before; it is suggested to be changed to "Cable Television (CATV) provider".

c) In page 8, line 22 the recitation "$m(t)^{\cos(w_c t+\theta_i)}$" is improper (see figure 3); it is suggested to be changed to "$m(t)\cos(w_c t+\theta_i)$".

d) In page 9, line 3 the recitation "$^{\cos(w_c t+\theta_o)}$" is improper (see figure 3); it is suggested to be changed to "$2\cos(w_c t+\theta_o)$".

e) In page 9, line 4 the equation is not understood.

f) In page 9, line 7 the equation is not understood.

g) In page 9, line 9 the equation is not understood.

h) In page 9, line 11 the equation is not understood.

i) In page 9, line 12 the second equation is not understood.

j) In page 9, line 13 the equations are not understood.

k) In page 9, line 14 the last symbols are not understood.

l) In page 20 lines 9-16 the recitation "FIG. 8 illustrates a method of generating a difference signal according to one embodiment of the invention. After quantizing the first and second output signals, the first quantized signal may be multiplied by the first output signal, in step 230, and the second output signal may be multiplied by the second output signal, in step 232. The resulting signals may be transmitted to a summer. The summer may be used to calculate an algebraic difference between the resulting signals, in step 234. The algebraic difference may be represented by a difference signal. The difference signal may then be filtered" is improper (see drawing objections above and figure 4); it is suggested to be changed to "FIG. 8 illustrates a method of generating a difference signal according to one embodiment of the invention. After quantizing the first and second output signals, the first quantized output signal may be multiplied by the second output signal, in step 230, and the first output signal may be multiplied by the second quantized output signal, in step 232. The resulting signals may be transmitted to a summer. The summer may be used to calculate an algebraic difference between the resulting signals, in step 234. The algebraic difference may be represented by a difference signal. The difference signal may then be filtered"

m) In page 20, line 17 the recitation "for modulating" is improper because it is a demodulator; it is suggested to be changed to "for demodulating".

n) In page 23, line 3 the recitation "and the first output signal may be multiplied by the first quantized signal" is improper (see figure 4); it is suggested to be changed to "and the second output signal may be multiplied by the first quantized signal".

o) In page 23, line 4 the recitation "The second quantized signal and the second output signal" is improper (see figure 4); it is suggested to be changed to "The second quantized signal and the first output signal".

Appropriate correction is required.

Claim Objections

Claims 1-57 are objected to because of the following informalities:

As per claim 1, the recitation in lines 10-11 of claim 1 "generating a difference signal for the first quantized signal and the second quantized signal" is improper, because it is not understood what it means; it is suggested to be changed to "generating a difference signal from the first quantized signal and the second quantized signal" (emphasis added).

As per claims 2-28, they are objected because they depend directly or indirectly from claim 1.

As per claim 29, the recitation in lines 10-11 of claim 29 "a difference signal generator structured to generate a difference signal for the first quantized signal and the second quantized signal" is improper, because it is not understood what it means; it is suggested to be changed to "a difference signal generator structured to generate a difference signal from the first quantized signal and the second quantized signal" (emphasis added).

As per claims 30-56, they are objected because they depend directly or indirectly from claim 29.

As per claim 57, the recitation in lines 10-11 of claim 57 "means for generating a difference signal for the first quantized signal and the second quantized signal" is improper, because it is not understood what it means; it is suggested to be changed to "means for generating a difference signal from the first quantized signal and the second quantized signal" (emphasis added).

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 6-8 and 34-36 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

As per claims 6 and 34, the disclosure doesn't disclose that filtering the local signal to produce a first duplicate signal and a second duplicate signal uses a plurality of low-pass filters.

As per claims 7-8 and 35-36, they are rejected because they depend directly or indirectly from claims 6 and 34, and claims 6 and 34 are rejected.

Claims 10-13 and 38-41 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject

matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

As per claims 10 and 38, the disclosure doesn't disclose that filtering the local signal to produce a first duplicate signal and a second duplicate signal comprises a band-pass filter.

As per claims 11-13 and 39-41, they are rejected because they depend directly or indirectly from claims 10 and 38, and claims 10 and 38 are rejected.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 7, 8, 11,12, 18, 21, 22, 27, 35, 36, 39, 30, 42, 46, 49, 50 and 55 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As per claim 7, Claim 7 is rejected because the recitation in line 2 of claim 7 "approximately equal" is vague and indefinite. It is not clear when a filter is "approximately equal" and when a filter is not "approximately equal".

As per claim 8, claim 8 is rejected because depends directly from claim 7, and claim 7 is rejected.

As per claim 8, claim 8 is rejected because the recitation in lines 1-2 of claim 8 "approximately 3 gigahertz" is vague and indefinite. It is not clear if 2.7 gigahertz is "approximately 3 gigahertz" or if 2.7 gigahertz is not "approximately 3 gigahertz"

As per claim 11 is rejected because the recitation in line 2 of claim 11 "approximately 3 gigahertz" is vague and indefinite. It is not clear if 2.7 gigahertz is "approximately 3 gigahertz" or if 2.7 gigahertz is not "approximately 3 gigahertz"

As per claim 12, claim 12 is rejected because depends directly from claim 11, and claim 11 is rejected.

As per claim 12, claim 12 is rejected because the recitation in line 2 of claim 12 "approximately 5 gigahertz" is vague and indefinite. It is not clear if 5.2 gigahertz is "approximately 5 gigahertz" or if 5.2 gigahertz is not "approximately 5 gigahertz".

As per claim 18, claim 18 is rejected because the recitation in line 2 of claim 18 "approximately a bit time duration" is vague and indefinite. It is not clear if 1.1 bit time duration is "approximately a bit time duration" or if 1.1 a bit time duration is not "approximately a bit time duration".

As per claims 21 and 49, claims 21 and 49 is rejected because they claim "multiplying a first quantized signal with the first output signal", but in figure 4 and the description in page 12 lines 9-13 discloses "multiplying a first quantized signal with the second output signal", so claims 21 and 49 are vague and indefinite, because they do not represent what is disclosed in the drawings and in the specification.

As per claims 22 and 50, claims 22 and 50 is rejected because they claim "multiplying a second quantized signal with the second output signal", but in figure 4 and the description in page 12 lines 9-13 discloses "multiplying a second quantized signal with the first output signal", so claims 22 and 50 are vague and indefinite, because they do not represent what is disclosed in the drawings and in the specification.

As per claim 27, claim 27 is rejected because the recitation in line 2 of claim 27 "about 1 millisecond" is vague and indefinite. It is not clear if 1.11 milliseconds is "about 1 millisecond" or if 1.11 milliseconds is not "about 1 millisecond".

As per claim 35, claim 35 is rejected because the recitation in line 2 of claim 35 "approximately equal" is vague and indefinite. It is not clear when a filter is "approximately equal" and when a filter is not "approximately equal".

As per claim 36, claim 36 is rejected because depends directly from claim 35, and claim 35 is rejected.

As per claim 36, claim 36 is rejected because the recitation in line 2 of claim 36 "approximately 3 gigahertz" is vague and indefinite. It is not clear if 2.7 gigahertz is "approximately 3 gigahertz" or if 2.7 gigahertz is not "approximately 3 gigahertz"

As per claim 39 is rejected because the recitation in line 2 of claim 39 "approximately 3 gigahertz" is vague and indefinite. It is not clear if 2.7 gigahertz is "approximately 3 gigahertz" or if 2.7 gigahertz is not "approximately 3 gigahertz"

As per claim 40, claim 40 is rejected because depends directly from claim 39, and claim 39 is rejected.

As per claim 40, claim 40 is rejected because the recitation in line 2 of claim 40 "approximately 5 gigahertz" is vague and indefinite. It is not clear if 5.2 gigahertz is "approximately 5 gigahertz" or if 5.2 gigahertz is not "approximately 5 gigahertz".

As per claim 42, claim 42 recites the limitation "output generator" in line 1. There is insufficient antecedent basis for this limitation in the claim.

As per claim 46, claim 46 is rejected because the recitation in line 2 of claim 46 "approximately a bit time duration" is vague and indefinite. It is not clear if 1.1 bit time duration is "approximately a bit time duration" or if 1.1 a bit time duration is not "approximately a bit time duration".

As per claim 55, claim 55 is rejected because the recitation in lines 2-3 of claim 55 "about 1 millisecond" is vague and indefinite. It is not clear if 1.11 milliseconds is "about 1 millisecond" or if 1.11 milliseconds is not "about 1 millisecond".

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 2, 5-7, 9-10, 14-24, 27-30, 33-35, 37-38, 42-52, and 55-57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoctor (US 6810087 B2) in view of Poklemba (US 4419759 A).

As per claims 1 and 29 Hoctor discloses receiving an incoming signal, wherein the incoming signal comprises a plurality of ultra-wideband pulses (figure 10D block 201; column 7 lines 40-44); approximating the incoming signal (figure 10D block 202; column 7 lines 40-44); generating a local signal (figure 10D block 204; column 8 lines 1-4); and generating a first output signal and a second output signal (figure 10D blocks 203a and 203b; column 7 lines 44-60). Hoctor doesn't disclose quantizing the first output signal and the second output signal to produce a first quantized signal and a

second quantized signal; generating a difference signal for the first quantized signal and the second quantized signal; and providing an error signal based on the difference signal. Poklemba discloses quantizing the first output signal and the second output signal to produce a first quantized signal and a second quantized signal (figure 1 blocks 22 and 28; column 1 lines 25-40); generating a difference signal for the first quantized signal and the second quantized signal (figure 1 blocks 24, 30 and 32; column 1 lines 41-45); and providing an error signal based on the difference signal (figure 1 output block 32 and input block 34; column 1 lines 25-40). Hoctor and Poklemba are analogous art because they are from similar problem solving area of carrier recovery. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the decoding system disclosed by Hoctor the carrier synchronization disclosed by Poklemba. The suggestion/motivation for doing so would have been to obtain effective carrier regeneration (Poklemba abstract).

As per claims 2 and 30, Hoctor and Poklemba disclose claims 1 and 29, Poklemba also discloses that local signal uses a phase-locked loop (abstract; figure 1; column 1 lines 25-40). Hoctor and Poklemba are analogous art because they are from similar problem solving area of carrier recovery. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the decoding system disclosed by Hoctor the carrier synchronization disclosed by Poklemba. The suggestion/motivation for doing so would have been to obtain effective carrier regeneration (Poklemba abstract).

As per claims 5 and 33, Hoctor and Poklemba disclose claims 1 and 30, Poklemba also discloses to produce a first duplicate signal and a second duplicate signal. Poklemba also discloses the use of filters (figure 1 block 20, 26 and 30; figure 2 block 48; figure 3 block 68; figure 6 blocks 112, 116 and 122; column 4 lines 25-48). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate a filter in the output of the local signal. The suggestion/motivation for doing so would have been to reduce the noise of the local signal.

As per claims 6 and 34, Hoctor and Poklemba disclose claims 5 and 33, Poklemba also discloses using a plurality of low-pass filters (figure 1 block 20, 26 and 30; figure 2 block 48; figure 3 block 68; figure 6 blocks 112, 116 and 122; column 4 lines 25-48). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate a filter in the output of the local signal. The suggestion/motivation for doing so would have been to reduce the noise of the local signal.

As per claims 7 and 35, Hoctor and Poklemba disclose claims 6 and 34, Poklemba also discloses a cut-off frequency of the plurality of low-pass filters is approximately equal (figure 1 block 20, 26 and 30; figure 2 block 48; figure 3 block 68; figure 6 blocks 112, 116 and 122 with 110, 114 and 120; column 4 lines 25-48). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate a filter in the output of the local signal. The suggestion/motivation for doing so would have been to reduce the noise of the local signal.

As per claims 9 and 37, Hoctor and Poklemba disclose claims 5 and 33, Poklemba also discloses using a matched filter (figure 1 block 20, 26 and 30; figure 2 block 48; figure 3 block 68; figure 6 blocks 112, 116 and 122; column 4 lines 25-48). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate a filter in the output of the local signal. The suggestion/motivation for doing so would have been to reduce the noise of the local signal.

As per claims 10 and 38, Hoctor and Poklemba disclose claims 9 and 37, Poklemba also discloses that the matched filter comprises a band-pass filter (figure 3 block 68; figure 4 block 82 and figure 5 block 94; figure 6 blocks 112, 116 and 122; column 4 lines 25-48). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate a filter in the output of the local signal. The suggestion/motivation for doing so would have been to reduce the noise of the local signal.

As per claims 14 and 42, Hoctor and Poklemba disclose claims 1 and 29, Hoctor also discloses multiplying a first duplicate signal and the incoming signal to produce a first output signal (figure 10D block 203a; column 7 lines 44-60).

As per claims 15 and 43, Hoctor and Poklemba disclose claims 14 and 29, Hoctor also discloses delaying a phase of a second duplicate signal to produce a delayed phase signal (figure 10D block 205; column 7 lines 44-60).

As per claims 16 and 44, Hoctor and Poklemba disclose claims 15 and 43, Hoctor also discloses using a delay circuit from the group consisting of a 90-degree

phase delay circuit and a 270-degree phase delay circuit (figure 10D block 205; column 7 lines 44-60).

As per claims 17 and 45, Hoctor and Poklemba disclose claims 15 and 43, Hoctor also discloses delaying a rising edge of the incoming signal (figure 10D block 205; column 7 lines 44-60).

As per claims 18 and 46, Hoctor and Poklemba disclose claims 17 and 45, Hoctor also discloses delaying shapes the incoming signal to approximately a one bit time duration (figure 10D block 205; column 7 lines 44-60).

As per claims 19 and 47, Hoctor and Poklemba disclose claims 1 and 29, Hoctor also discloses multiplying a delayed phase signal and the incoming signal to produce a second output signal (figure 10D block 203b; column 7 lines 44-60).

As per claims 20 and 48, Hoctor and Poklemba disclose claims 1 and 29, Poklemba also discloses filtering the first output signal and the second output signal (figure 1 blocks 20 and 26; figure 6 blocks 110, 112; column 1 lines 25-45; column 4 lines 25-48). Hoctor and Poklemba are analogous art because they are from similar problem solving area of carrier recovery. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the decoding system disclosed by Hoctor the carrier synchronization disclosed by Poklemba. The suggestion/motivation for doing so would have been to obtain effective carrier regeneration (Poklemba abstract).

As per claims 21 and 49, Hoctor and Poklemba disclose claims 1 and 29, Poklemba also discloses multiplying a first quantized signal with the first output signal

(figure 6 block 200; column 4 lines 25-48; figure 1 block 24; figure 6 block 126; column 1 lines 25-45; column 4 lines 25-48). Hoctor and Poklemba are analogous art because they are from similar problem solving area of carrier recovery. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the decoding system disclosed by Hoctor the carrier synchronization disclosed by Poklemba. The suggestion/motivation for doing so would have been to obtain effective carrier regeneration (Poklemba abstract).

As per claims 22 and 50, Hoctor and Poklemba disclose claims 1 and 29, Poklemba also discloses multiplying a second quantized signal with the second output signal (figure 6 block 204; column 4 lines 25-48; figure 1 block 30; figure 6 block 124; column 1 lines 25-45; column 4 lines 25-48). Hoctor and Poklemba are analogous art because they are from similar problem solving area of carrier recovery. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the decoding system disclosed by Hoctor the carrier synchronization disclosed by Poklemba. The suggestion/motivation for doing so would have been to obtain effective carrier regeneration (Poklemba abstract).

As per claims 23 and 51, Hoctor and Poklemba disclose claims 1 and 29, Poklemba also discloses calculating an algebraic difference between the first quantized signal and the second quantized signal (figure 1 block 32; figure 6 block 128; column 1 lines 25-45; column 4 lines 25-48). Hoctor and Poklemba are analogous art because they are from similar problem solving area of carrier recovery. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to

incorporate in the decoding system disclosed by Hoctor the carrier synchronization disclosed by Poklemba. The suggestion/motivation for doing so would have been to obtain effective carrier regeneration (Poklemba abstract).

As per claims 24 and 52, Hoctor and Poklemba disclose claims 1 and 29, Poklemba also discloses filtering the difference signal (figure 1 block 34; figure 6 block 130; column 1 lines 25-45; column 4 lines 25-48). Hoctor and Poklemba are analogous art because they are from similar problem solving area of carrier recovery. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the decoding system disclosed by Hoctor the carrier synchronization disclosed by Poklemba. The suggestion/motivation for doing so would have been to obtain effective carrier regeneration (Poklemba abstract).

As per claims 27 and 55, Hoctor and Poklemba disclose claims 1 and 29, Hoctor also discloses each of the plurality of ultra-wideband pulses has a duration ranging from about 10 picoseconds to about 1 millisecond (column 10 lines 1-17).

As per claims 28 and 56, Hoctor and Poklemba disclose claims 1 and 29, Hoctor also discloses each of the plurality of ultra-wideband pulses has at least one of a phase and amplitude that conveys data (column 4 lines 18-32).

As per claim 57, Hoctor discloses means for receiving an incoming signal, wherein the incoming signal comprises a plurality of ultra-wideband pulses (figure 10D block 201; column 7 lines 40-44); means for approximating the incoming signal (figure 10D block 202; column 7 lines 40-44); means for generating a local signal (figure 10D block 204; column 8 lines 1-4); and means for generating a first output signal and a

second output signal (figure 10D blocks 203a and 203b; column 7 lines 44-60). Hoctor doesn't disclose means for quantizing the first output signal and the second output signal to produce a first quantized signal and a second quantized signal; means for generating a difference signal for the first quantized signal and the second quantized signal; means for and providing an error signal based on the difference signal. Poklemba discloses means for quantizing the first output signal and the second output signal to produce a first quantized signal and a second quantized signal (figure 1 blocks 22 and 28; column 1 lines 25-40); means for generating a difference signal for the first quantized signal and the second quantized signal (figure 1 blocks 24, 30 and 32; column 1 lines 41-45); means for and providing an error signal based on the difference signal (figure 1 output block 32 and input block 34; column 1 lines 25-40). Hoctor and Poklemba are analogous art because they are from similar problem solving area of carrier recovery. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the decoding system disclosed by Hoctor the carrier synchronization disclosed by Poklemba. The suggestion/motivation for doing so would have been to obtain effective carrier regeneration (Poklemba abstract).

Claims 3, 4, 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoctor and Poklemba as applied to claim 2 above, and further in view of Flach (US 20010034475 A1).

As per claims 3 and 31, Hoctor and Poklemba disclose claims 2 and 30, Hoctor and Poklemba don't disclose that the phase-locked loop is gated. Flach discloses a gated phase-locked loop is gated (figure 5A block 536; paragraph [0139]). Hoctor,

Poklemba and Flach are analogous art because they are from similar problem solving area of carrier recovery. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the decoding system disclosed by Hoctor and Poklemba the gated VCO technique disclosed by Flach. The suggestion/motivation for doing so would have been to conserve power (Flach paragraph [0139]).

As per claims 4 and 32, Hoctor, Poklemba and Flach disclose claims 3 and 31. Flach also discloses the phase-locked loop is gated by the incoming signal (figure 5A block 536; paragraph [0139]). Hoctor, Poklemba and Flach are analogous art because they are from similar problem solving area of carrier recovery. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the decoding system disclosed by Hoctor and Poklemba the gated vco technique disclosed by Flach. The suggestion/motivation for doing so would have been to conserve power (Flach paragraph [0139]).

Claims 8, 11, 12, 36, 39, 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoctor and Poklemba as applied to claims 7, 10, 35 and 38 above, and further in view of Leeper ("wireless data blaster", Scientific American, 2002 Vol 286, No. 5 May 2002 pp 64-69).

As per claims 8 and 36, Hoctor and Poklemba disclose claims 7 and 35. Hoctor and Poklemba don't disclose that the cut-off frequency is approximately 3 gigahertz. Leeper discloses that the cut-off frequency in a UWB system is approximately 3 gigahertz (page 68 figure 2 and page 69 second paragraph). Hoctor and Leeper are

analogous art because they are from the same field of endeavor of UWB. Hoctor, and Poklemba are analogous art because they are from similar problem solving area of carrier recovery. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the decoding system disclosed by Hoctor and Poklemba the frequency rage disclosed by Leeper. The suggestion/motivation for doing so would have been to transmit very high data speed (Leeper page 66 right column 4th paragraph beginning with "At the present").

As per claims 11 and 39, Hoctor and Poklemba disclose claims 10 and 38. Hoctor and Poklemba don't disclose that the cut-off frequency is approximately 3 gigahertz. Leeper discloses that the cut-off frequency in a UWB system is approximately 3 gigahertz (page 68 figure 2 and page 69 second paragraph). Hoctor and Leeper are analogous art because they are from the same field of endeavor of UWB. Hoctor, and Poklemba are analogous art because they are from similar problem solving area of carrier recovery. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the decoding system disclosed by Hoctor and Poklemba the frequency rage disclosed by Leeper. The suggestion/motivation for doing so would have been to transmit very high data speed (Leeper page 66 right column 4th paragraph beginning with "At the present").

As per claims 12 and 40, Hoctor, Poklemba and Leeper disclose claims 11 and 39. Leeper also discloses a center frequency of the passband is approximately 5 gigahertz (page 68 figure 2 and page 69 second paragraph). Hoctor and Leeper are analogous art because they are from the same field of endeavor of UWB. Hoctor, and

Poklemba are analogous art because they are from similar problem solving area of carrier recovery. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the decoding system disclosed by Hoctor and Poklemba the frequency rage disclosed by Leeper. The suggestion/motivation for doing so would have been to transmit very high data speed (Leeper page 66 right column 4th paragraph beginning with "At the present").

Claims 13 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoctor and Poklemba as applied to claims 10 and 39 above, and further in view of Claydon (US 5793818 A).

As per claims 13 and 41, Hoctor and Poklemba disclose claims 10 and 38. Hoctor and Poklemba don't disclose that the transfer function of the matched filter approximates a transfer function of the transmitter transmitting the incoming signal. It is inherently to a matched filter that the transfer function of the matched filter approximates a transfer function of the transmitter transmitting the incoming signal and Claydon discloses that the transfer function of the matched filter approximates a transfer function of the transmitter transmitting the incoming signal (figure 6 block 54 and 567; column 8 lines 8-22). Hoctor, Poklemba and Claydon are analogous art because they are from similar problem solving area of carrier recovery. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the decoding system disclosed by Hoctor and Poklemba the matching filter disclosed by Claydon. The suggestion/motivation for doing so would have been to to restore the signal to its pre-transmission character (Claydon column 8 lines 9-14).

Claims 25, 26, 53 and 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoctor and Poklemba as applied to claims 1 and 29 above, and further in view of Tran (US 5715276 A) (with LeFever (US 4599732 A) to support motivation).

As per claims 25 and 53, Hoctor and Poklemba disclose claims 1 and 29, Hoctor and Poklemba don't disclose one multi-level quantizer. Tran discloses one multi-level quantizer (figure 1 and column 20 lines 1-14). Hoctor, Poklemba and Tran are analogous art because they are from similar problem solving area of carrier recovery. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the decoding system disclosed by Hoctor and Poklemba the multi-level quantizer disclosed by Tran. The suggestion/motivation for doing so would have been to obtain the desired accuracy (see LeFever (US 4599732 A) column 5 lines 4-9).

As per claims 26 and 54, Hoctor, Poklemba and Tran disclose claims 25 and 54, Tran also discloses the at least one multi-level quantizer is selected from a group consisting of: a mu-law quantizer, a 4 level quantizer, a 8 level quantizer, and a 16 level quantizer (figure 1 and column 20 lines 1-14). Hoctor, Poklemba and Tran are analogous art because they are from similar problem solving area of carrier recovery. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the decoding system disclosed by Hoctor and Poklemba the multi-level quantizer disclosed by Tran. The suggestion/motivation for doing so would

have been to obtain the desired accuracy (see LeFever (US 4599732 A) column 5 lines 4-9).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Richards (US 6925109 B2) discloses de use of a Costa loop in a UWB receiver (column 40 line 54 to column 41 line 4). Moss ("Universal carrier recovery for APK signals", Proceedings of the IEEE, Volume 71, Issue 7, July 1983 Page(s): 905 –907) discloses a Costas loop similar to figure 1 in Poklemba (US 4419759 A). Marshall (US 6795517 B1) discloses a Low power phase locked loop frequency synthesizer. Kanterakis (US 5956375 A) discloses a fast-acting Costas loop.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Juan A. Torres whose telephone number is (571) 272-3119. The examiner can normally be reached on Monday-Friday 9:00 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad H. Ghayour can be reached on (571) 272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Juan Alberto Torres
04-06-2006

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